

MR. THOMAS EDWARD, the Banff naturalist, has reprinted in a separate form some useful and interesting papers on the Protection of Wild Birds. The pamphlet is to be had at the Banffshire Journal Office.

THE additions to the Zoological Society's Gardens during the past week include an Egyptian Gazelle (*Gazella dorcas*) from Egypt, presented by the Earl of March, F.Z.S.; a Common Genet (*Genetta vulgaris*), South European, presented by the Rev. F. P. Voules; a Giant Toad (*Bufo agui*) from Brazil, presented by Mr. Carl Hagenbeck; a Long-snouted Snake (*Passerita mycterizans*) from India, presented by Mr. H. H. Black; an Amherst's Pheasant (*Thaumalea amherstiae*) from Szechuen, China, a Black Swan (*Cygnus atratus*) from Australia, purchased; a Tiger (*Felis tigris*), a Bactrian Camel (*Camelus bactrianus*), a Sambur Deer (*Cervus aristotelis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

A NEW VARIABLE STAR.—On July 26, 27, and 29, 1783, D'Agelet observed a star which he twice estimated 6m., and on the last night 6.5m.; it is No. 5057.9 in Gould's reduced catalogue, the mean of the three observations giving for 1800, R.A. 19h. 23m. 47.57s. and Decl. + 17° 19' 42".8. The only subsequent observation we have yet found of this star is in the *Durchmusterung*, where it is rated as low as 9.4m.; there is consequently a high probability that it will prove to be a remarkable variable. The position brought up to the beginning of 1880 will be R.A. 19h. 27m. 22.1s., Decl. + 17° 29' 28". D'Agelet's original observations will be found at pp. 542, 544, and 546 of the *Histoire Céleste* of Lalande.

MINIMA OF ALGOL, ETC., IN 1880.—Prof. Julius Schmidt has published his observations, or rather the results of his observations, of Algol and other variable stars, made at Athens during the past year. On comparing his epochs of minima with the formula in Prof. Schonfeld's last catalogue, it will be found that according to the most completely determined minima the calculation is too late by nearly half an hour. But the differences between calculation and observation are very irregular, so that if we take a mean of the whole, the true minimum would appear to be earlier than that computed by only nineteen minutes. The minima between August 28 and December 21 are here compared.

According to the observations of the same indefatigable astronomer *Mira Ceti* was at a maximum between July 20 and 25, but in 1880 it only attained about 4.2 m. A maximum of R Leporis occurred about November 9; the determination is not very certain. The intervals between maximum and minimum, and *vice versa* of a Herculis were as irregular as usual.

THE RED SPOT UPON JUPITER'S DISK.—Dr. Jedrzejewicz has published some inferences from observations for ascertaining the time of rotation of the eastern extremity of the large red spot upon the disk of Jupiter, made at his private observatory at Pionsk during the winter of 1880-81. The instrument employed is a refractor six inches aperture, with powers 225 to 300. In December he measured the length of the spot 9".8, and considers that his own observations compared with those of Prof. Schmidt at Athens, indicate that the length of the spot remained unchanged during the winter. On this assumption he finds for the time of rotation 9h. 55m. 34.414s. $\pm 0.13s$, by 174 rotations between November 25, 1880, and February 5, 1881. Prof. Schmidt from 1021 rotations between July 23, 1879, and September 17, 1880, obtained the value 9h. 55m. 34.422s. $\pm 0.05s$. for the middle of the spot. In 1862, by observations upon a spot which he says was much darker and a more favourable object for the purpose than the spots observed by Airy and Mädler in 1834-35, and which was not much larger than the shadow of the third satellite he had found for the time of rotation 9h. 55m. 25.684s. agreeing with the previously-determined values. While the period from observations of the red spot is 9s. greater, Prof. Schmidt remarks that it agrees very nearly with that already obtained by Mr. Pratt.

THE MINOR PLANETS.—It appears that the object detected by Herr Palisa at the new Observatory of Vienna on the 23rd of

last month, and which was announced as No. 220 of the small-planet group, may prove to be No. 139 *Juewa*, which had not been observed since 1874. It was discovered by the late Prof. Watson at Pekin on October 10 in that year, while he was engaged upon one of the United States expeditions for the observation of the transit of Venus, and as was reported at the time, without the aid of a chart of telescopic stars, but from his memory of their configuration about the particular spot occupied by the planet. It was observed on November 8 by Rümker at Hamburg, but the length of observation was not sufficient to determine the mean motion with any degree of accuracy; hence although the elements had been several times brought up to more recent dates by Watson, the planet had not been recovered up to last month.

By the last Berlin circular it would seem that *Ismene* will fall little short of *Hilda* in the length of its revolution, and these two minors will thus stand out as exceptional members of the group. By the latest elements the period of *Hilda* is 2860 days or 7.832 years, and that of *Ismene* 2854 days or 7.814 years.

Calculation has assigned the shortest period to No. 149 *Medusa*, but this awaits confirmation, perhaps in the next summer, when the planet should again come into opposition according to the imperfect elements at present available.

PHYSICAL NOTES

M. PLANTAMOUR continues to study with his sensitive levels the phenomena of periodic rise and fall of the ground which he has observed in Switzerland. He believes he has established a connection between these periods and those of the changes of temperature of the earth's surface, there being an annual change of level in an east-west direction corresponding with the mean temperatures of the surface during the year.

M. ROSENSTIEHL concludes from his researches on the sensations of colour recently noticed that the three fundamental colour sensations of the Young-Helmholtz-Maxwell theory correspond to the following tints of the pure spectrum. *Orange-red*, three-fourths of the distance from C to D amongst the Fraunhofer lines, a *yellow-green* three-quarters of the distance from D to E, and a *blue* situated at one-third from F towards G. The principle upon which this selection is made is that the selected tint fulfils the following conditions: (a) it is equidistant between two tints which are complementary to one another; (b) it produces with either of the other selected tints another colour having a minimum of white admixed with it. Thus the yellow-green chosen is midway between that yellow and that blue which produce the best white with one another, and it gives with the selected orange-red a yellow more intense than any known yellow pigment under equal illumination, and with the selected blue gives a green more intense than the richest green pigment.

M. HENRI BECQUEREL observes that the specific magnetism of ozone exceeds that of oxygen, and is much greater than could be accounted for by the difference in density of these two allotropic forms of the gas.

IN view of recent terrible colliery explosions in Belgium, M. Cornet has called attention (in the Belgian Academy) to a possible interference of winds, blowing in an inclined direction, with the proper ventilation of mines. Most of the "fiery" Belgian mines have two shafts, one for raising the coal and for descent of air, which, passing along the galleries, is drawn up the other shaft by a ventilating engine. The orifice of the latter shaft is generally (unlike that of the other) unsheltered by buildings; it debouches directly in the air a little above the ground. Obviously, then, a strong wind, blowing with downward inclination towards this orifice, might seriously affect the ventilating action. It is noted that one explosion in Hainaut on November 19, 1880, followed a night of very high wind, which M. Cornet shows to have been capable of depressing ventilation considerably. Mines with large sections are more dangerous than others in atmospheric perturbations. The true remedy, however (in the author's opinion), is not increasing the resistance to the air-currents, but sheltering the orifices of the ventilating shafts against descending winds.

IN a recent paper on the optical structure of ice (to the Freiburg Society of Naturalists) Prof. Klocke finds that while in the ice individuals the plane of the secondary axes is fixed by the position of the principal axis, they are subject to no law as to direction in that plane.

THE phenomenon of *verglas* occurred at Urbino in Italy twice in January; and from his observations of it Prof. Serpieri con-

cludes (*Real. Ist. Lomb. Rend.*) that surfusion of the rain-drops is not indispensable to its production. Surfusion indeed accelerates it, as do also violence of wind and intense cold; but a rain with temperature not so low as zero falling into an air-current in rapid motion and below zero gives the phenomenon. It is pointed out, however, that the mist which usually accompanies verglas being driven against objects by the wind, and its particles being in a state of surfusion (the temperature being below zero), probably contributes to the general result, helping to make the ice-layer regular and uniform. If the verglas be such that the drop freezes wholly at once, the latter has probably contained many small crystals of ice.

M. MERCADIER sums up his researches on Radiophony by saying that he believes that the phenomena are due to a vibratory movement set up by the alternate heating and cooling, due to the intermittent beams of heat-rays, of the gaseous layer adjacent to the solid surface at which the radiations are absorbed; being an anterior layer in the case of solid bodies, a posterior layer in the case of transparent bodies.

M. JANSSEN has succeeded in photographing the *lumière cendrée*, or "earth-shine" on the moon when three days old: in the photograph the "continents" were to be distinguished clearly from the "seas." This disposes of the view sometimes advanced, and held, we believe, by some most eminent astronomers, that the "new moon in the arms of the old" was an optical illusion.

PROF. D. W. BEETZ, of the Technical High School of Munich, wishes us to say that in the note (vol. xxiii. p. 442) on the modulus of elasticity of rods of carbon, he, and not Herr Holtz, should have been mentioned as the author of the paper on the subject in *Wied. Ann.*

GEOGRAPHICAL NOTES

AT the meeting of the Geographical Society on Monday Mr. J. B. Minchin, who has spent some seven years in the country, read an excellent paper on Eastern Bolivia, which also included some observations on the Gran Chaco. After some preliminary remarks Mr. Minchin dwelt at length on the water-system of the country, and, speaking first of the lakes, he mentioned that between the Rivers Pilcomayo and Paraguay, in the unexplored Chaco, the Indians report the existence of a lake which no white man has ever yet seen, but which is perhaps near 22° S. lat. The rivers belong to Amazon and Plate systems, and with the exception of the Paraguay and the Itenez, they mostly have their sources among the highest summits of the Andes. The Parapite, Mr. Minchin added, is the most southerly affluent of the Amazons, which in some maps has been made to flow across the Chaco into the Paraguay. The Pilcomayo also does not, as has been thought, receive any tributaries on its course through the Chaco, so far as can be learned from the Indians. Mr. Minchin afterwards alluded to his expedition over the Matto Grossi Mountains, which he succeeded in crossing for the first time. The latter part of the paper was largely devoted to the animal and vegetable productions of Eastern Bolivia and to the commercial condition of the country. The discussion which followed turned chiefly on the route of the future into Bolivia, whether it would be most advantageous to follow the Paraguay route or develop a new one by the Madera.

MR. E. G. RAVENSTEIN has nearly completed for the Council of the Geographical Society the large map of Eastern Equatorial Africa, on which he has been engaged for nearly three years under the direction of their Scientific Purposes Committee. The original drawings will be reduced before they are engraved, and the map when published will be in twenty-four sheets, and on a scale of 1 : 1,000,000. It will take in the lake region, the Upper Congo, and the Upper Nile, and on the east coast will extend from Somali Land to a little south of the Zambesi, the precise limits of the map being from 10° N. to 20° S. lat., and from 25° to 52° E. long. A very complete bibliography of authorities, compiled *pari passu* with the map, will be published afterwards.

MR. BROMPTON, an agent of the China Inland Mission at Kweiyang-fu, in the province of Kweichow, has lately sent home an account of a visit which he had paid by invitation to the Miao-tsze tribes a short distance off. He had been told by one of them, from whom he had been learning something of the language, that in the third moon of the year his people had large gatherings in the hills, and was asked to be present at these

festivities. He accordingly went and had an excellent opportunity for observing the manners and customs of this section of this comparatively unknown people. He describes their dress, the character of the festivities witnessed, the singular musical instruments used, &c. The particular tribes visited by Mr. Brompton are known as the Black (from the colour of their clothes) and the Ka-teo tribes, and live near Hwangping-chow.

MR. CARL BOCK is leaving for Siam next week, where he intends to make an excursion into the interior. His book, "The Headhunters of Borneo," will be published shortly by Messrs. Sampson Low and Co.

WE hear that Mr. Edward Whymper, who has already given an account of some phases of his South American journey to the Alpine Club and the Society of Arts, will read a paper on the Andes of Ecuador before the Geographical Society on May 9.

PRIZES OF THE PARIS ACADEMY OF SCIENCES

AT the public *séance* of the Academy on March 14 the annual distribution of prizes took place. While many of these prizes are offered for particular subjects, others are devoted to rewarding the most important advances made during the year in special departments of science.

The Grand Prize of the Mathematical Sciences was awarded to M. Halphen for work on the theory of linear differential equations.

In astronomy Mr. Stone receives the Lalande prize for his stellar researches, following those of Abbé de Lacaille, at the Cape of Good Hope; and the Valz prize goes to M. Tempel for his observations on comets. M. Vinot's labours in starting and editing *Le Ciel* are recognised by the award of the Tremont prize.

The Montyon prize of the mechanical arts is given to M. Cornut for his study of the faults of iron plates; the Poncelet prize to M. Leauté for various works; while a recompense of 1500 francs on the Bordin foundation is given to M. Lan for improved modes of combustion, diminishing the trouble and harm from smoke, &c. (in steel heating). The extraordinary prize of 6000 francs (for improving the efficacy of naval forces), and the Plumey prize, are not awarded.

In physics we find a recompense of 3000 francs given to M. Ader, on the Vaillant foundation, for improvements in phonetic telegraphy. The grand prize for researches on elasticity of crystalline bodies is not awarded.

The Jecker prize goes to M. Demarçay for important work in organic chemistry; the Gegner prize to M. Jacquelin for skill in preparing a large number of substances in a pure state, &c.

Two prizes on the Bordin foundation are awarded in geology, one to M. Gosselet for a geological sketch of the North of France, the other to MM. Falsan and Chantre for their geological monography of ancient glaciers and erratic deposits in the middle of the Rhone Valley. Recompenses on the Gay foundation are awarded to MM. Delage and Chevrement for observations on movements of the coast-line in France.

In medicine and surgery three Montyon prizes are awarded: one to Dr. Charcot for his work on localisation of disorders of the brain; another to Dr. Sappery for researches on the lymphatic apparatus of fishes; the third to Dr. Jullien for important medical researches. On the Bréant foundation M. Colin is awarded 5000 francs for physiological researches. Dr. Segond receives the Godard prize for an important work in surgery; Dr. Quinard the Barbier prize for researches on the quantity of oxygen in human blood in health and in disease. The Dugate prize (having regard to prevention of premature burial) is not given, but MM. Onimus, Peyrand, and Le Bon are recompensed for their researches. The Boudet prize is awarded to Prof. Lister.

In experimental physiology the Montyon prize is given to M. Bonnier for researches on the nectaries and colours of plants.

The Fons-Melicoq prize for botanical research in the north of France is gained by M. de Vicq; and M. de la Chapelle receives 1000 francs on the Desmazières foundation for studies on French cryptogams.

In anatomy and zoology the Grand Prize with reference to distribution of marine animals on the French coast is withheld.